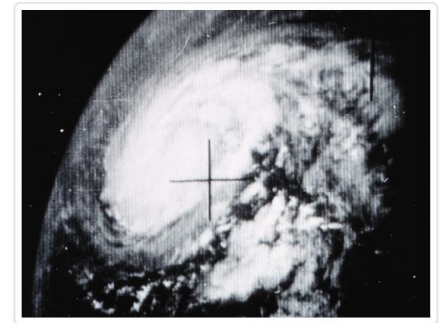




NATIONAL WEATHER SERVICE
Protecting Lives and Property for 150 Years

Crossroads in Wx History: Becoming a Weather-Ready Nation

■ **Dr. Louis W. Uccellini, Director, National Weather Service**
NWS Partners Meeting, January 16, 2020



150 Years...

- Saving Lives ...
- Protecting Property ...
- Enhancing the Nation's Economy

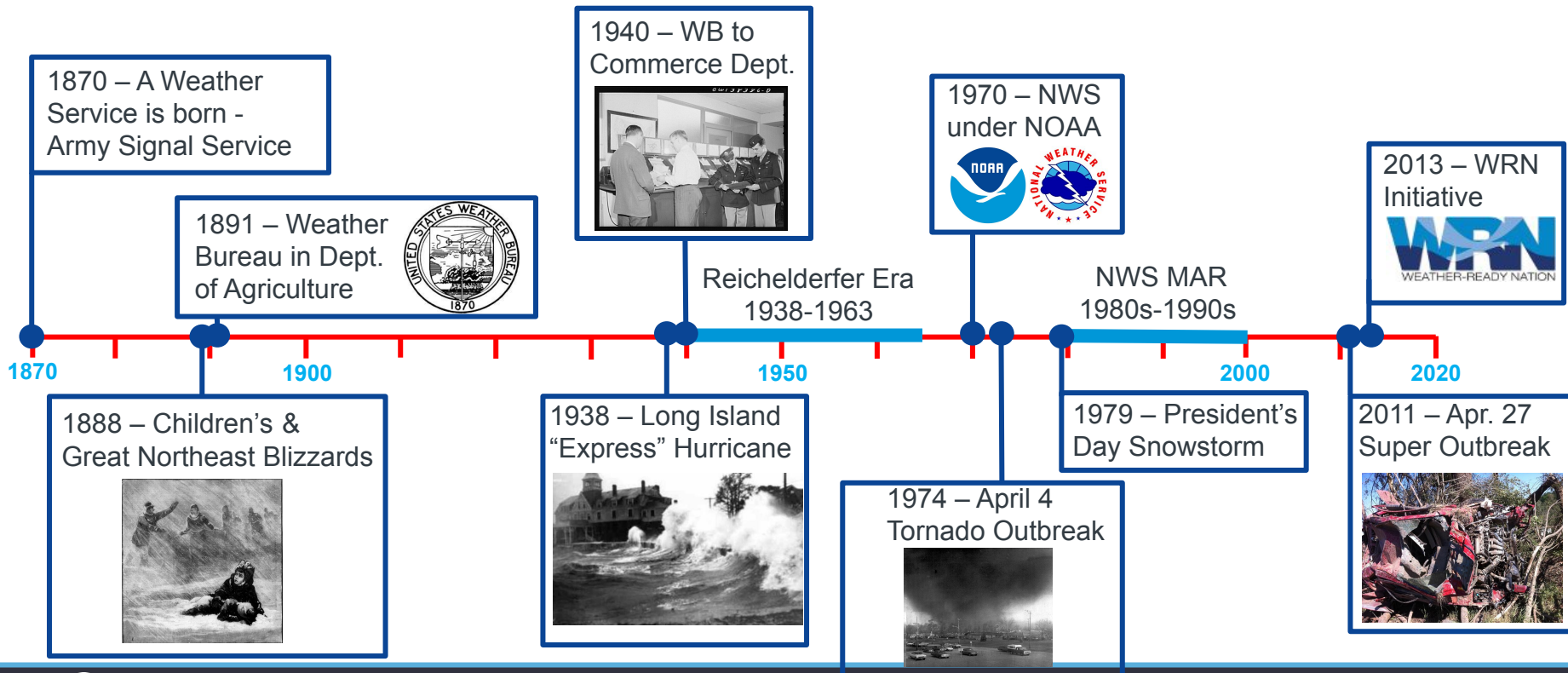


Our partnership isn't something that just happened in the last few decades, it's been a recurring theme since the beginning...



NWS Heritage

Protecting Life & Property for 150 Years



Increase A. Lapham...for the public good

We propose, in this article to suggest a few reasons why it would have been wisdom and good policy in the Legislature to have adopted the measure proposed, and we cannot do better than to commence by making the following quotation from a report of Elias Loomis of the University of the city of New York, showing of the advantages that may be expected to arise from the study of meteorology,--

"Very little argument is needed to prove that our comfort and convenience and not infrequently our lives and property are dependent upon meteorological phenomena.* * *

"But how can the study of meteorology benefit the sailor? Will it enable him to calm the tempest or subdue the raging sea?"

*Most a
school*

"Very little argument is needed to prove that our comfort and convenience and not infrequently our lives and property are dependent upon meteorological phenomena." - Increase A. Lapham

Article by Increase A. Lapham for Northwestern Journal of Science and Education, 1850

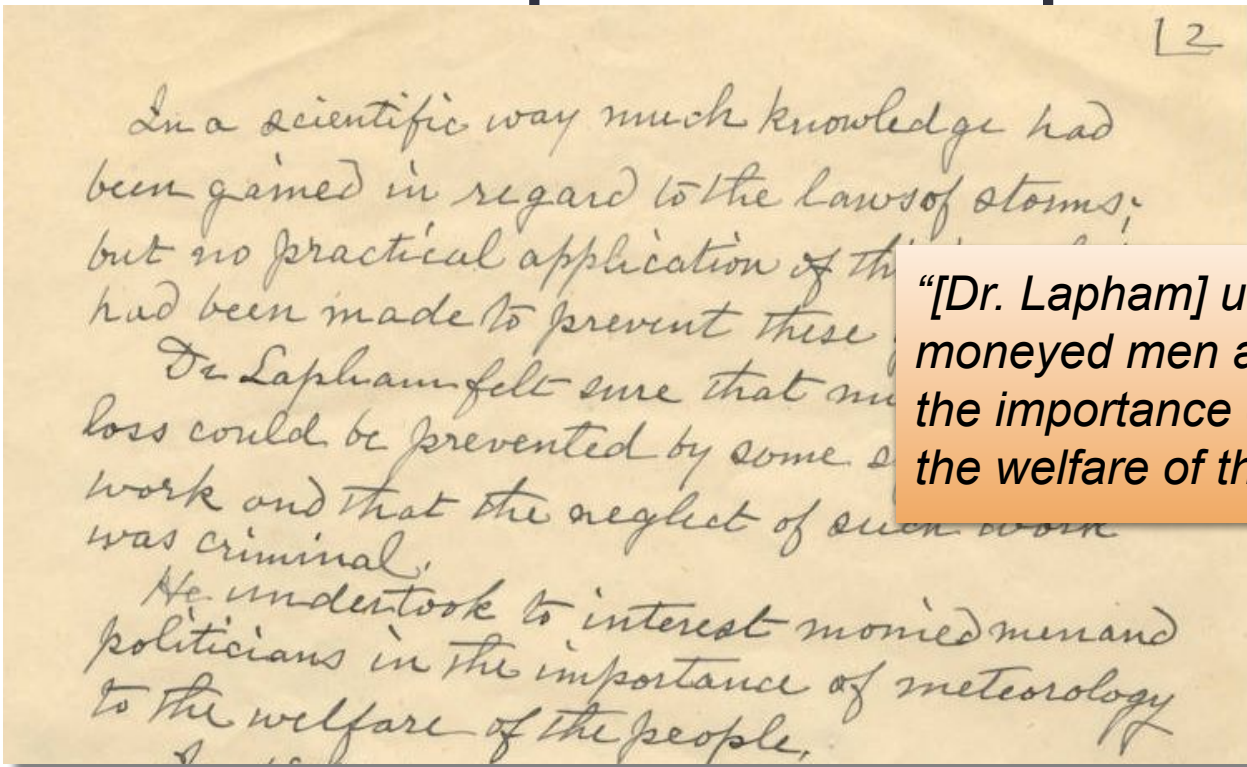
Source: Wisconsin Hist. Society



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Increase A. Lapham...for the public good



“[Dr. Lapham] undertook to interest moneyed men and politicians in the importance of meteorology to the welfare of the people.”

Essay written by Julia Lapham, 1916. Source: Wisconsin Hist. Society



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Building a Weather-Ready Nation // 6

Crossroads in Weather History:

Where Serving Public & Private Needs Intersect

Change Driven by:

- Advances in science, technology, and engineering
- National and global economic transitions
- Catalyzing extreme events



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1888: Children's and East Coast Blizzards



- With Signal Service upheaval, a Catalyst for creating the Weather Bureau in Ag. Dept.

“The Chief of the Weather Bureau, under the direction of the Secretary of Agriculture ... shall be charged with the forecasting of weather, the issue of storm warnings, the display of weather and flood signals for the benefit of agriculture, commerce and navigation...”

- SB 1451 (1890)



45th Street and Grand Central Depot, New York, Blizzard, March 1888



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1930s: Aviation Drives Weather Needs



- 1926 - Air Commerce Act is enacted. The Weather Bureau is assigned duty to provide aviation-related observations and forecasts.
- September 1938 - Long Island Express; not forecast to hit L.I. & New England
- December 1938 - Reichelderfer Era Begins
- 1940 - President Franklin D. Roosevelt transfers Weather Bureau to Department of Commerce.

“[T]he navigation of the air is rapidly extending to its civil and commercial or industrial stage. Flying in ignorance or disregard of meteorological conditions and warnings is at times suicidal and destructive of costly property.”

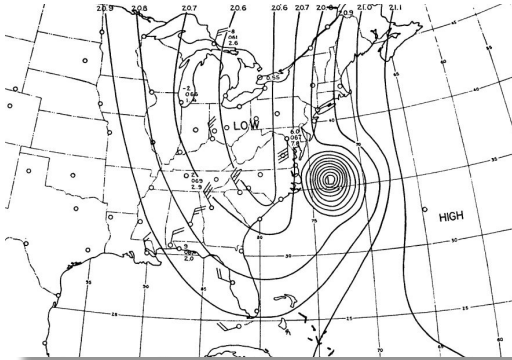
- WB Chief Charles Marvin, 1919



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1938: The L.I. Express & Rise of Dynamic Forecasting



10K ft Analysis, Sep. 21, 1938 4:00 a.m



- As WB employees deal with the sudden death of Chief Willis Gregg, conflict emerges between Bergen School acolytes and traditionalists.
- The Long Island Express hits with little warning
- With support from the U.S. Navy, Carl Rossby and others, Francis Reichelderfer named Weather Bureau Chief, quickly establishing more scientific rigor.
- WB fully adopts air mass and fluid dynamics techniques.

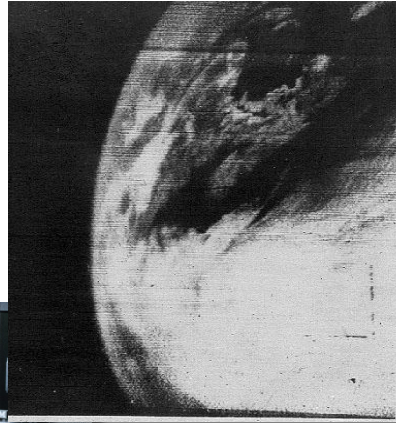
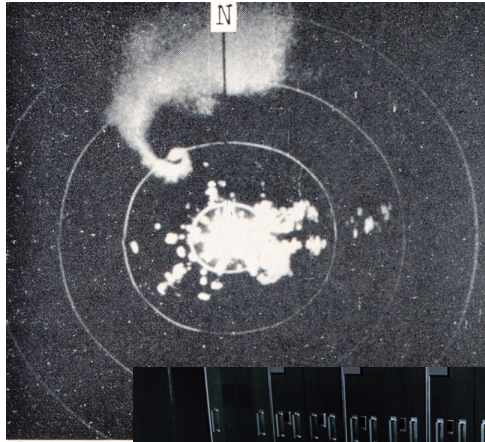


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Building a Weather-Ready Nation //10

1945: Post-War Tech Boom



- War's end brings expanded tech capabilities.
- Nat RAOB Network, Operational NWP, Radar Network, Satellites
- Radar, Numerical Weather Prediction, Satellites, Radio/Television enhance obs, forecasting, dissemination capabilities.
- WMO emerges; focus on international collaboration.
- New opportunities for the private sector.



1974: Apr. 3-4 Super-Outbreak



An F5 tornado strikes Xenia, OH, Apr. 3, 1974

- 150 Tornadoes across 13 states
- 6 F5, 24 F4 tornadoes
- “Indications” the night before
- Watches issued based on 1200 UTC Radiosonde obs
- Warnings issued when tornadoes spotted

314 Fatalities

Helped drive the need for a “modernized” approach to warnings based on Doppler Radar Data



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Building a Weather-Ready Nation //12

2011: Apr. 27-28 Super-Outbreak



A destroyed wood frame house in Concord, AL

- ~200 Tornadoes across 16 states
- 4 EF5, 11 EF4 tornadoes
- Outlooks issued 4-6 days in advance
- Extreme threat recognised 20 hours in advance
- Watches based on wide range of data, updated regularly
- Warnings based on Doppler radar
- ~24 min. average lead time

316 Fatalities



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Building a Weather Ready Nation

“A Vital Conversation”

December 2011 Workshop in Norman, OK

- Focus on the “last mile”: delivery of warnings
- Assess and update warning dissemination strategy
 - Integrate social and physical science
 - Is the message delivered equal to the message received?
- Impact-based Forecast and Warnings for a wide range of decision makers (from ‘organized’ to ‘loosely coupled’ to ‘individuals’)
- Improved outreach and education



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Bringing it to Now

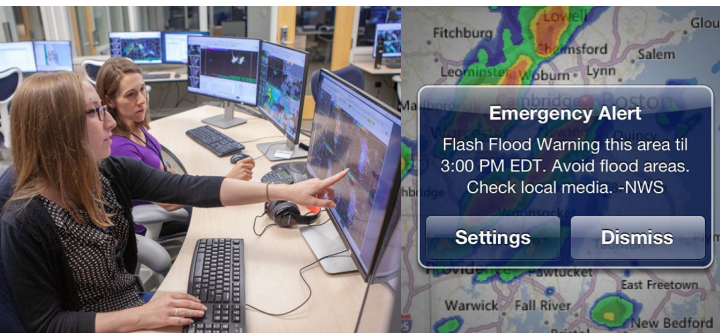
Building a
Weather-Ready
Nation Initiated

Weather
Research &
Forecasting
Innovation Act
of 2017 -
Authorized IDSS
Approach

NWS
Evolve Effort -
Transforming
Toward a
Collaborative
Forecast

NWS 2019-2022 Strategic Plan

- Transform way people receive & act on Info.
- Harness science & tech
- Evolve through people, partnerships & organizational performance



NATIONAL WEATHER SERVICE

Protecting Lives and Property for 150 Years

EVOLVING THE NATIONAL WEATHER SERVICE TO BUILD A WEATHER-READY NATION -

Connecting Observations, Forecasts, and Warnings to Decision-Makers through Impact-Based Decision Support Services

Authors: Louis W. Uccellini and John Ten Hoeve

Reference:
Uccellini, L., Ten Hoeve, J. (2019). Evolving the National Weather Service to Build a Weather-Ready Nation; Connecting Observations, Forecasts, and Warnings to Decision-Makers through Impact-Based Decision Support Services. Bulletin of the American Meteorological Society, (100), 10. 1924-1942.

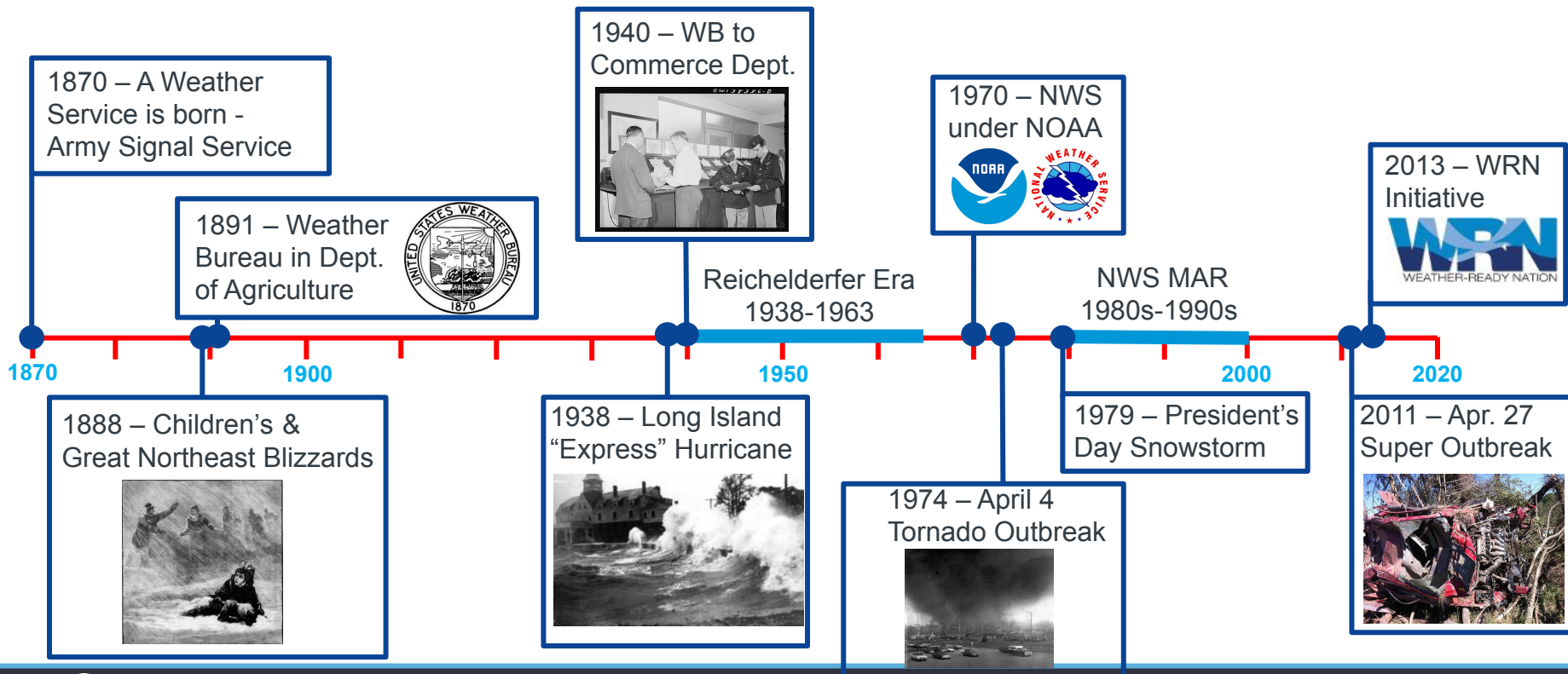


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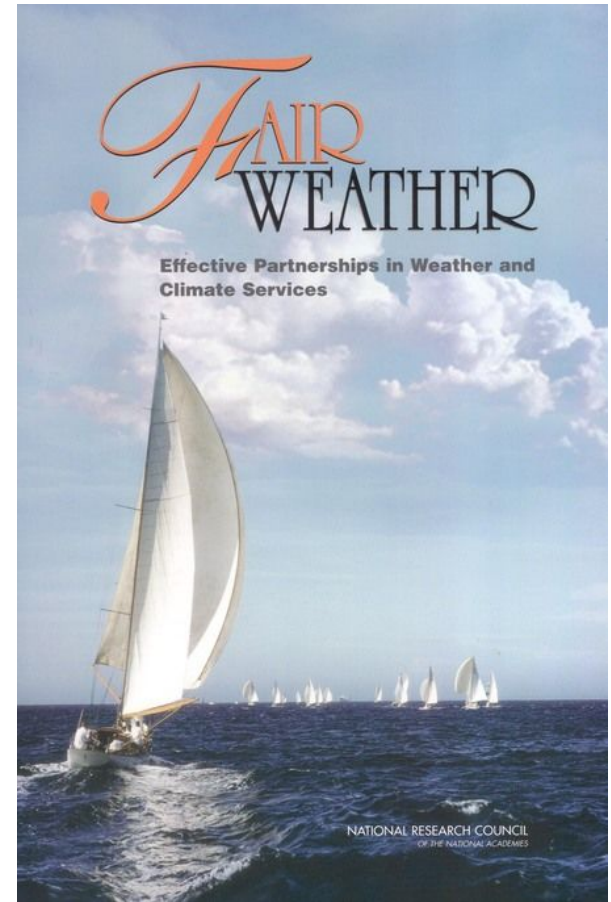
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Fair Weather Report (2003)

- Still Relevant Today
- AMS – New commission formed for public-private “neutral ground”
 - Today, this is the **CWWCE**
- Brought the private and public sectors together and accelerated the growth of entire Enterprise
- International community is in awe of our **public-private** community and what we do across the entire value chain to serve commerce and public safety



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Cg-18: Geneva Declaration 2019

1999:

We EXPRESS deep concern

about the potential impacts on the provision of meteorological services worldwide **of any development which endangers** the unique and integrated international system for obtaining and exchanging meteorological and related data and products, a system which has benefited the global community for over 100 years. **These developments can adversely affect the effective and efficient provision of appropriate meteorological data, information, products and services, as well as the role and operation of National Meteorological and Hydrometeorological Services,** resulting in unfavourable impacts on national economies, the environment, the well being of peoples and the whole world community.

2019:

We WELCOME

- **The opportunities for all stakeholders** and the broader user community that will result from a closer collaboration among public, private and academic sectors;
- **The engagement of all sectors in addressing the societal needs** through weather, climate, water and other environmental information and services;
- **The contributions of Members and partner international organizations** to sustaining and developing the global meteorological infrastructure coordinated by WMO through its programmes;
- **The evolving role of WMO as a facilitator in establishing and expanding partnerships among stakeholders, from public, private and academic sectors ...**



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Observations

- ASOS SLEP: Integration testing for new hardware and software
- Nexrad SLEP: Perform Pedestal & Generator refurbishment
- RFMP: Complete autolauncher installations in Alaska & begin site prep and installation of remaining 8 autolaunchers in CONUS
- SPADES IOR for GOES-16 and 17 space weather

Central Processing

- Award WCOSS Follow-on Contract
- Transition 12 National Center desks into AWIPS
- Complete deployment of Hazard Services IOC to all WFOs and deploy Hydro Hazards

Science & Tech Integration

- EPIC Support: Public release of global atmosphere FV3GFS code with community support
- Implement NBM v3.2 into operations on WCOSS



FY2020

**WRN Ambassador Initiative
10,500+ Ambassadors**

Facilities

- Complete WFO Cleveland relocation
- Complete FCA Phase IV
- Award Design/Construction Contracts for 4 relocations (Slidell, LA; Charleston, WV; Burlington, VT; Albany, NY)

Dissemination

- Maintain NWR services at 96% availability
- Maintain IDP Operational availability at 99%
- Demonstrate development cloud environment for MRMS v12
- SPADES Phase 1 (GOES-16) on IDP

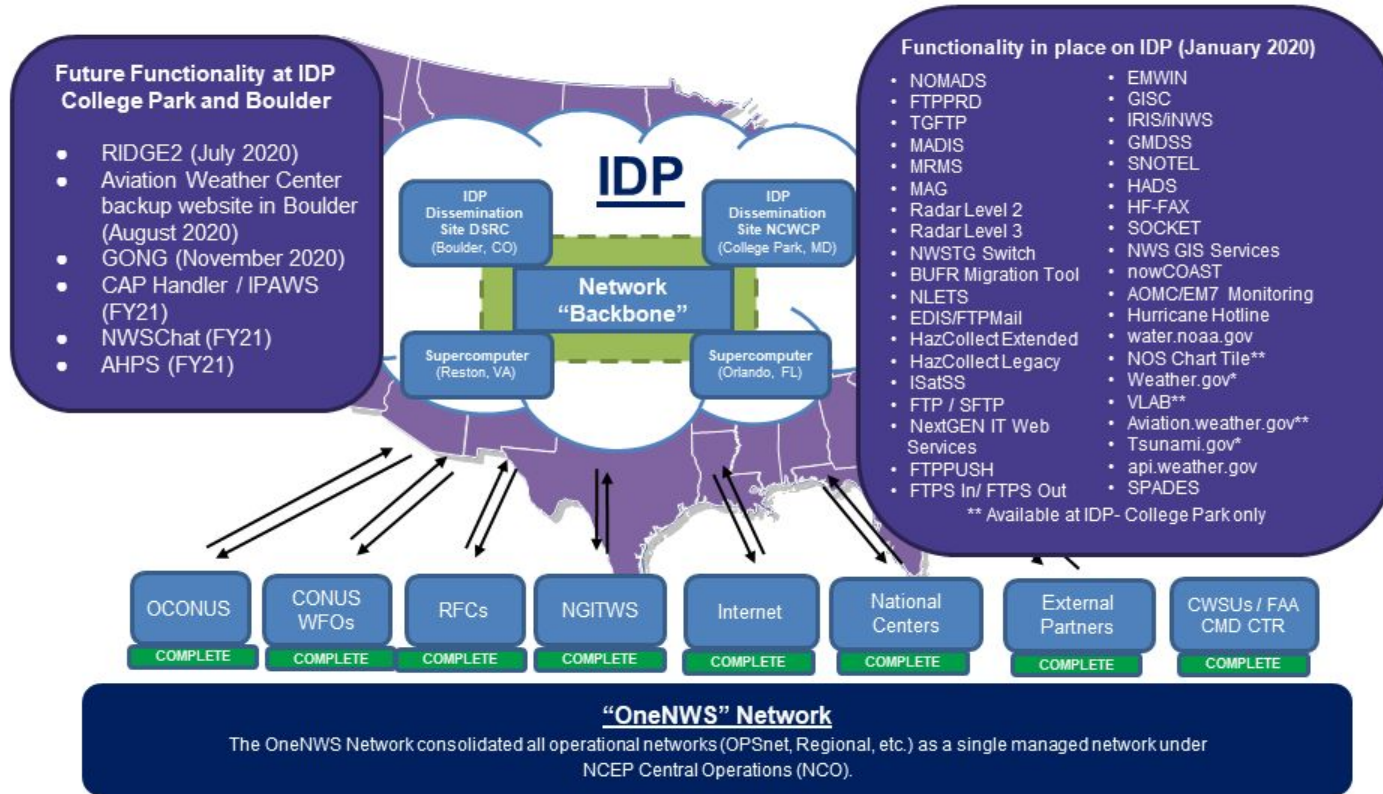
Analyze, Forecast and Support

- SWPC designated as Global ICAO Space Weather Center
- Hazard Simplification recommendations queued for implementation decision
- Transfer of National Ice Center to Ocean Prediction Center in support of operational sea ice forecasting
- 100 New StormReady Communities recognized
- 50 new and renewed Tsunami Ready Communities recognized
- Initiate flood inundation mapping (FIM) techniques using the River Forecast Center (RFC) official forecast for Northeast River Forecast Center (NERFC) domain.



Integrated Dissemination Program (IDP)

Long-Term Sustainable Solution



Overall Status:

Additional Operational and/or Milestone Comments:

Dissemination

11/21 17352-21562: Users unable to access NWSChat due to database corruption in Silver Spring. NWSChat was failed over to Kansas City to restore functionality.

IDP Applications

API	AWC Web	BMT	Chart Tile	EDIS	EMWIN
FTP	FTPmail	FTPPush	FTPS	GIS	GISC/OpenWIS
GMDSS	HC Extended	HC Legacy	HF Fax	Himawari	iNWS
IRIS	IsatSS	LDM	MADIS	MAG	MRMS
Network	NIDS (IDP)	NLETS	NOMADS	nowCOAST	OWP
Radar 2	Radar 3	Sockets	SPADES	TGFTP	Trouble Tickets
VLAB					

Non-IDP Applications

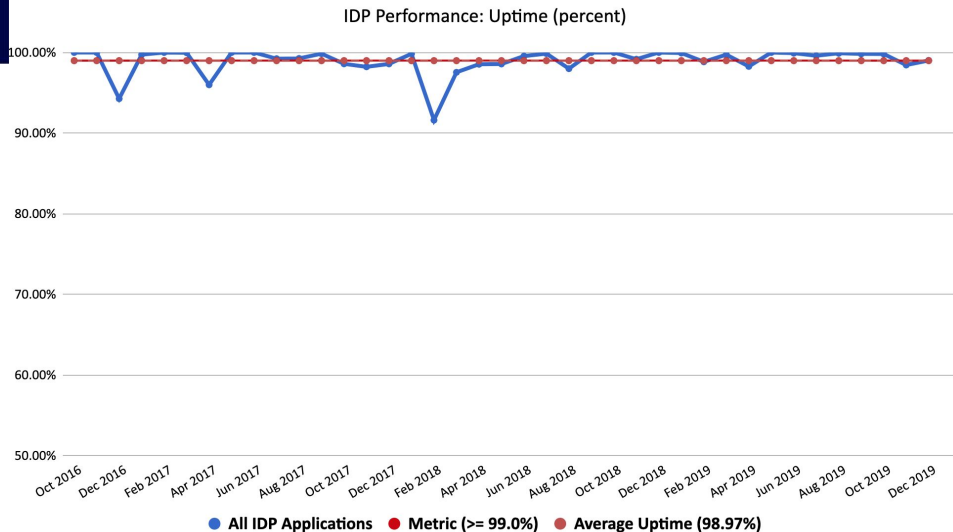
AHPS	NDFD	NIDS (Non-IDP)	NWSChat	Other	SPOT
Weather Wire - OI					

Color-Code Key:

- Milestone Achieved
- Fully Capable
- Degraded Capability
- No Capability

Monitoring Systems Daily

Tracking Reliability



Where We're Headed

- Advancing IDSS across all services
- Improving both physical and social sciences
- Strengthening public-private partnerships
- EPIC
- NWS 150th Anniversary on February 9th



Thank you!

